



*Fully Licensed*

## INSTRUCTION MANUAL

**MANUFACTURER**

**Magic Conversion Co.**

P.O. Box 3263

820 Elmwood Avenue

Providence, RI 02907

**(401) 461-9389**

**DISTRIBUTOR**

## IGMO DIAGNOSTICS

In order to aid the operator in quickly locating and correcting problems in the IGMO game board, several comprehensive diagnostic routines were provided in IGMO software. A diagnostic button provided on the harness and designed to be located inside the arcade cabinet will allow the operator to enter the diagnostic program. After depressing the diagnostic button, the diagnostic routines may be selected and executed by using the joystick and the fire button. A menu will be displayed upon entering the diagnostics and will display the following diagnostic routines:

1. CURRENT SETTINGS
2. COLOR TABLE
3. SCRATCHPAD RAM
4. VIDEO RAM
5. ROM
6. CONVERGENCE
7. BUTTONS
8. EXIT

The above eight selections are described as follows:

1. CURRENT SETTINGS- Upon entering this routine, the status of the dip switches will be displayed along with a description of the function of each switch. Use this routine when checking the setting or use it as an aid in readjusting the settings. Among the game functions which may be adjusted are the number of IGMO's per credit, the number of credits per coin, the difficulty level and the extra IGMO level.
2. COLOR TABLE- The color table function will display the different colors of both palettes of the color PROM. If bad colors are found, the color PROM, U66, should be checked and if necessary, replaced.
3. SCRATCHPAD RAM- This routine allows U12 to be checked for faulty static ram locations. Should an error be found, try reseating U12. If an error still persists, replace U12.
4. VIDEO RAM- This routine performs several checks of the dynamic ram comprising the display ram. At the end of the routine, the status of each dynamic ram is displayed. Faulty dynamic rams should be replaced with 150ns 4116's. If errors persist, the ram controllers, U37 and U58, should be suspected.

5. ROM- This selection performs a ROM checksum which should point out data and program memory errors should they exist. Faulty EPROM's will be identified after the execution of this routine. Try reseating the EPROM's before assuming an EPROM failure. If an EPROM is replaced, replace it with one of the same code number as indicated on the EPROM label.
6. CONVERGENCE- This routine displays a convergence pattern which allows the operator to align the color guns of the video game monitor.
7. BUTTONS- This routine allows the operator to locate faulty buttons. A tone will sound when a button is depressed or if a switch is shorted to ground. If no tone sounds when a button is depressed, faulty or dirty contacts should be suspected.
8. EXIT- This routine takes the operator out of diagnostics and into the regular game mode.

NOTE: Every time the game is powered-up, all necessary diagnostic routines are run to ensure the normal operation of the game. Should an error be located by the "self test" diagnostics, the error will be displayed on the screen.

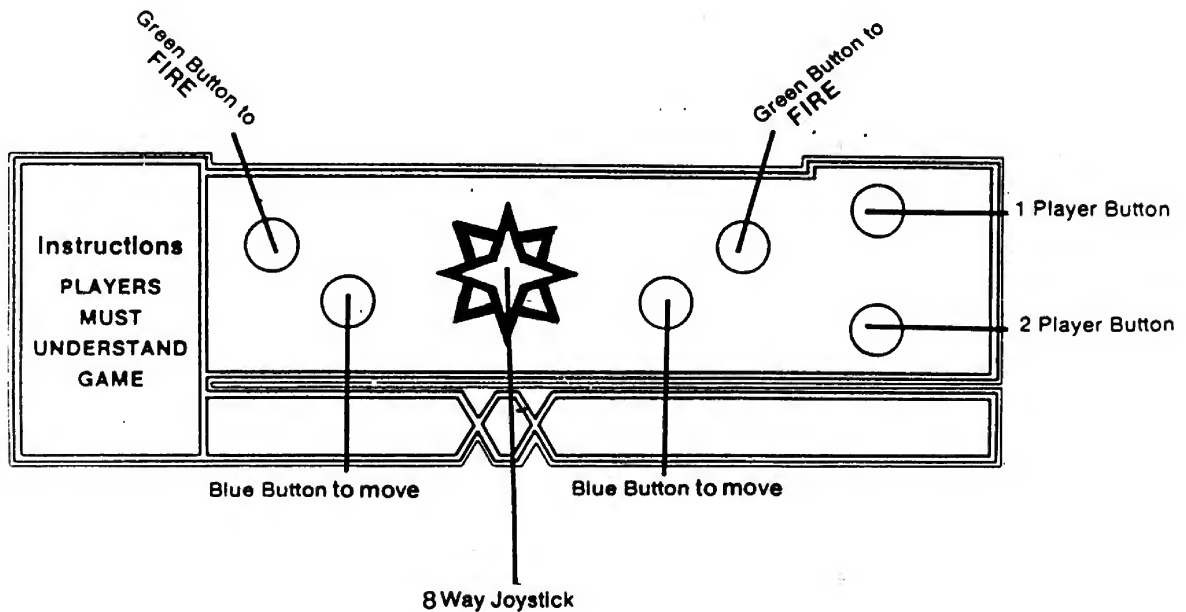
## CONVERTABILITY FEATURE

IGMO has an exclusive built-in convertability feature which enables the operator to quickly change IGMO into the next available conversion game. This convertability feature relies on the addition of an "ID MODULE" which will allow the game logic board to execute the new game. Wires are provided on the IGMO harness for the future connection to the "ID MODULE". (Do not detach these extra wires) IGMO does not require an "ID MODULE" therefore one was not provided. However, when the next conversion is purchased, a new set of EPROM's and an "ID MODULE" will be sent along with the installation instructions for the new game.

Because of the "ID MODULE" feature, new top earning games may be installed simply by replacing the EPROM's and the "ID MODULE" at a substantial savings to the operator.

## FRONT PANEL LAYOUT

*We suggest you follow this layout as it is working very well*



**It is important to put buttons on either side of Joystick to appeal to left or right handed players**

### Edgeconnector Assignments

Pin No.	SOLDER SIDE	Pin No.	PARTS SIDE
A	GND-Black	1	GND-Black
B	GND-Black	2	GND-Black
C	Plus 5 VDC-Red	3	Plus 5 VDC-Red
D	Plus 5 VDC-Red	4	Plus 5 VDC-Red
E	TO COIN COUNTER-Yellow	5	
F	LIGHT II-Yellow	6	LIGHT I-Orange
H	ID MODULE-Green	7	ID MODULE-White/Yellow
J	ID MODULE-Gray	8	ID MODULE-Purple
K	ID MODULE-Purple	9	ID MODULE-Gray
L	ID MODULE-White/Yellow	10	ID MODULE-White/red
M	JOYSTICK UP-White/Red	11	JOYSTICK RIGHT-Gray
N	JOYSTICK DOWN-Brown	12	JOYSTICK LEFT-Blue
P		13	FIRE BUTTON-Yellow
R	MOVE BUTTON - GREEN	14	
S	1 PLAYER GAME BUTTON-White	15	COIN IN-Gray
T		16	2 PLAYER GAME BUTTON-Brown
U		17	DIAGNOSTICS BUTTON-White/Red
V	BLUE GUN-Blue	18	GREEN GUN-Green
W	Plus 5 VDC-Red	19	Plus 5 VDC-Red
X	Plus 5 VDC-Red	20	Plus 5 VDC-Red
Y	GND-Black	21	GND-Black
Z	GND-Black	22	GND-Black
a	Minus 5 VDC-Brown	23	Minus 5 VDC-Brown
b	Minus 5 VDC-Brown	24	Minus 5 VDC-Brown
c	Plus 12 VDC-Orange	25	Plus 12 VDC-Orange
d	Plus 12 VDC-Orange	26	Plus 12 VDC-Orange
e	RED GUN-Red	27	SPEAKER-Yellow
f	EXTERNAL RESET-Purple	28	COMPOSITE SYNC-White

### Dip Switch Assignments

S1 . . . . . ON -- 1 credit per coin  
                  OFF - 2 credits per coin

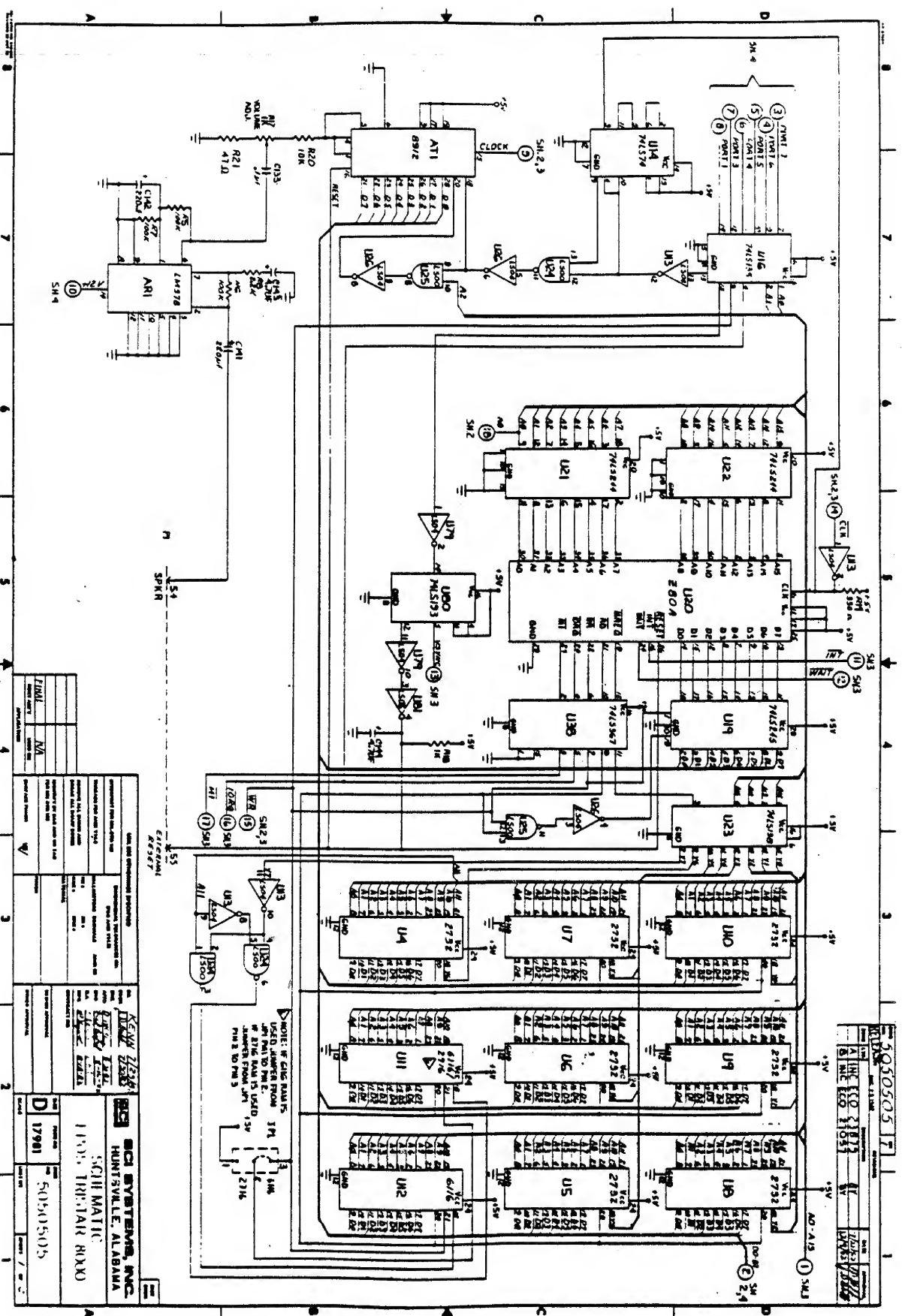
S2, S3 . . . . . ON, ON - 3 IGMO's per credit  
                  OFF, ON - 4 IGMO's per credit  
                  ON, OFF - 5 IGMO's per credit  
                  OFF, OFF - 6 IGMO's per credit

S4, S5 . . . . . ON, ON - Extra IGMO at 20000 points  
                  OFF, ON - Extra IGMO at 40000 points  
                  ON, OFF - Extra IGMO at 60000 points  
                  OFF, OFF - Extra IGMO at 80000 points

S6, S7, S8 . . . . . ON, ON, ON - Difficulty level 1  
                  OFF, ON, ON - Difficulty level 2  
                  ON, OFF, ON - Difficulty level 3  
                  OFF, OFF, ON - Difficulty level 4  
                  ON, ON, OFF - Difficulty level 5  
                  OFF, ON, OFF - Difficulty level 6  
                  ON, OFF, OFF - Difficulty level 7  
                  OFF, OFF, OFF - Difficulty level 8

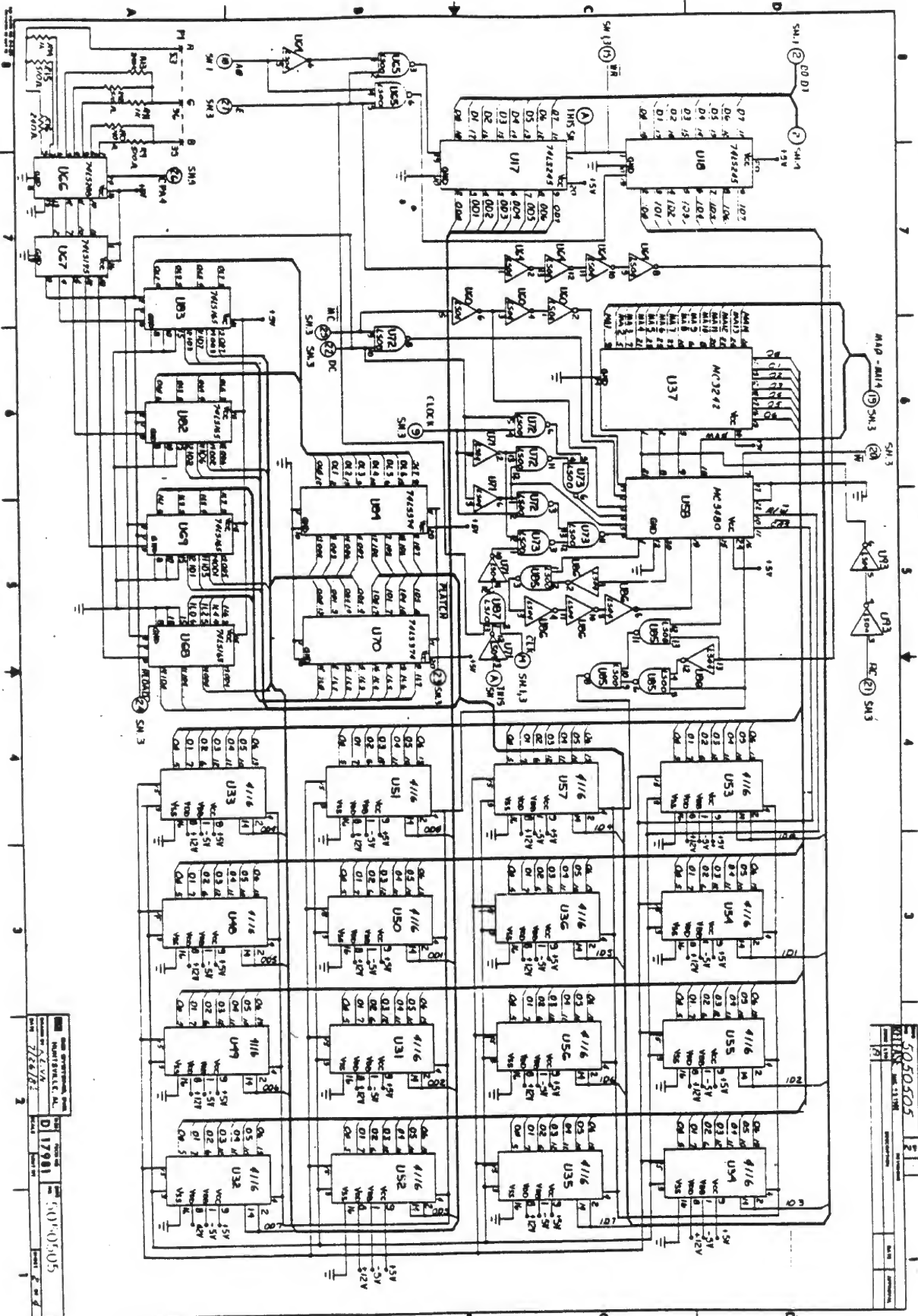
#### IMPORTANT INFORMATION CONCERNING THIS HARNESS

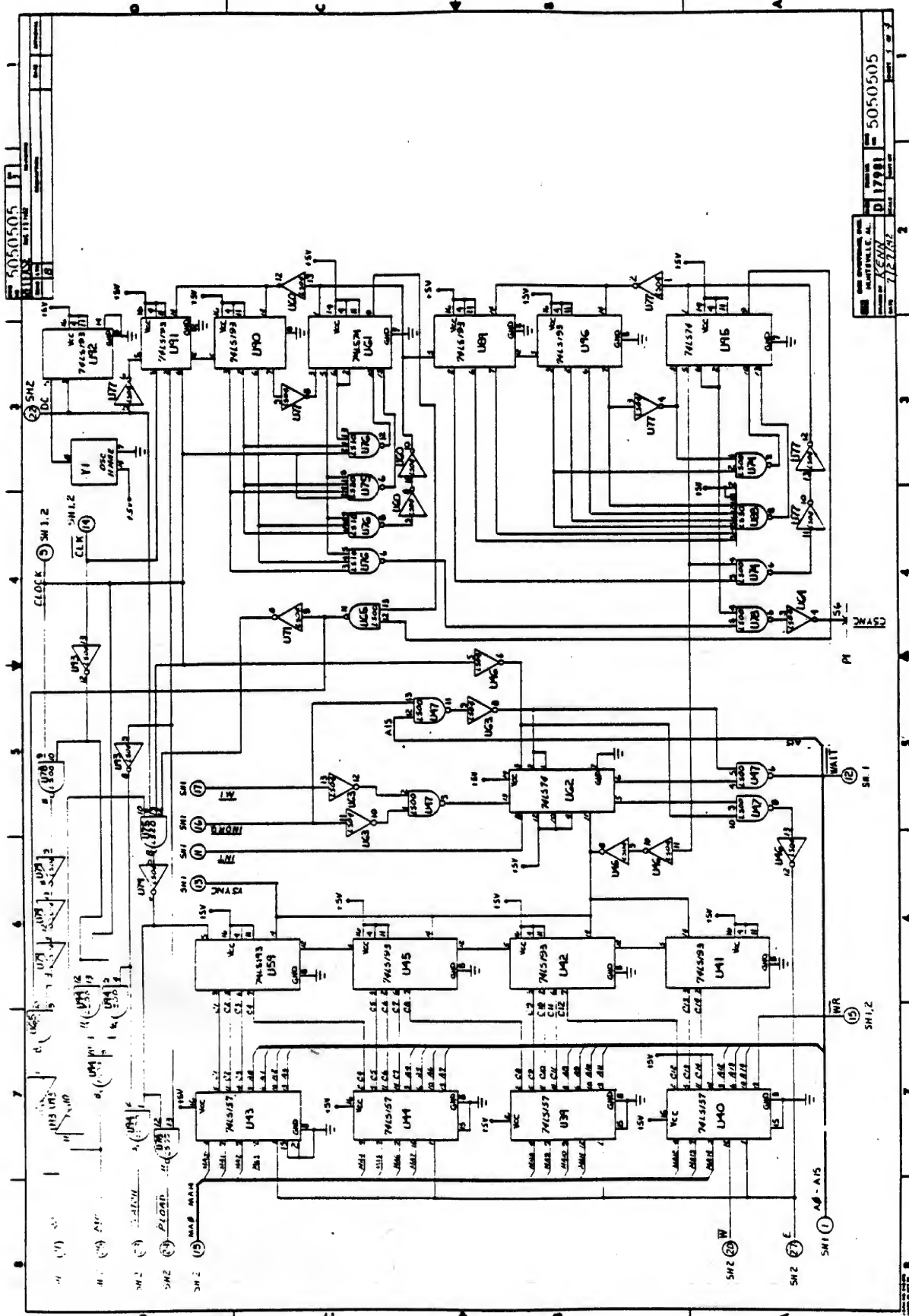
Wire groups labelled as GROUP 5 and GROUP 6 are provided for FUTURE GAME CONVERSIONS and are NOT required for operation of the IGMO game board. HOWEVER, it is strongly suggested that both groups (5 and 6) be unaltered and fastened securely to the side of the game cabinet for future use. Further information concerning game conversions can be obtained by corresponding with your distributor.



<b>REVISIONS</b> 1. 10/1/78 2. 11/1/78 3. 12/1/78 4. 1/1/79 5. 2/1/79 6. 3/1/79 7. 4/1/79 8. 5/1/79 9. 6/1/79 10. 7/1/79 11. 8/1/79 12. 9/1/79 13. 10/1/79 14. 11/1/79 15. 12/1/79 16. 1/1/80 17. 2/1/80 18. 3/1/80 19. 4/1/80 20. 5/1/80 21. 6/1/80 22. 7/1/80 23. 8/1/80 24. 9/1/80 25. 10/1/80 26. 11/1/80 27. 12/1/80 28. 1/1/81 29. 2/1/81 30. 3/1/81 31. 4/1/81 32. 5/1/81 33. 6/1/81 34. 7/1/81 35. 8/1/81 36. 9/1/81 37. 10/1/81 38. 11/1/81 39. 12/1/81 40. 1/1/82 41. 2/1/82 42. 3/1/82 43. 4/1/82 44. 5/1/82 45. 6/1/82 46. 7/1/82 47. 8/1/82 48. 9/1/82 49. 10/1/82 50. 11/1/82 51. 12/1/82 52. 1/1/83 53. 2/1/83 54. 3/1/83 55. 4/1/83 56. 5/1/83 57. 6/1/83 58. 7/1/83 59. 8/1/83 60. 9/1/83 61. 10/1/83 62. 11/1/83 63. 12/1/83 64. 1/1/84 65. 2/1/84 66. 3/1/84 67. 4/1/84 68. 5/1/84 69. 6/1/84 70. 7/1/84 71. 8/1/84 72. 9/1/84 73. 10/1/84 74. 11/1/84 75. 12/1/84 76. 1/1/85 77. 2/1/85 78. 3/1/85 79. 4/1/85 80. 5/1/85 81. 6/1/85 82. 7/1/85 83. 8/1/85 84. 9/1/85 85. 10/1/85 86. 11/1/85 87. 12/1/85 88. 1/1/86 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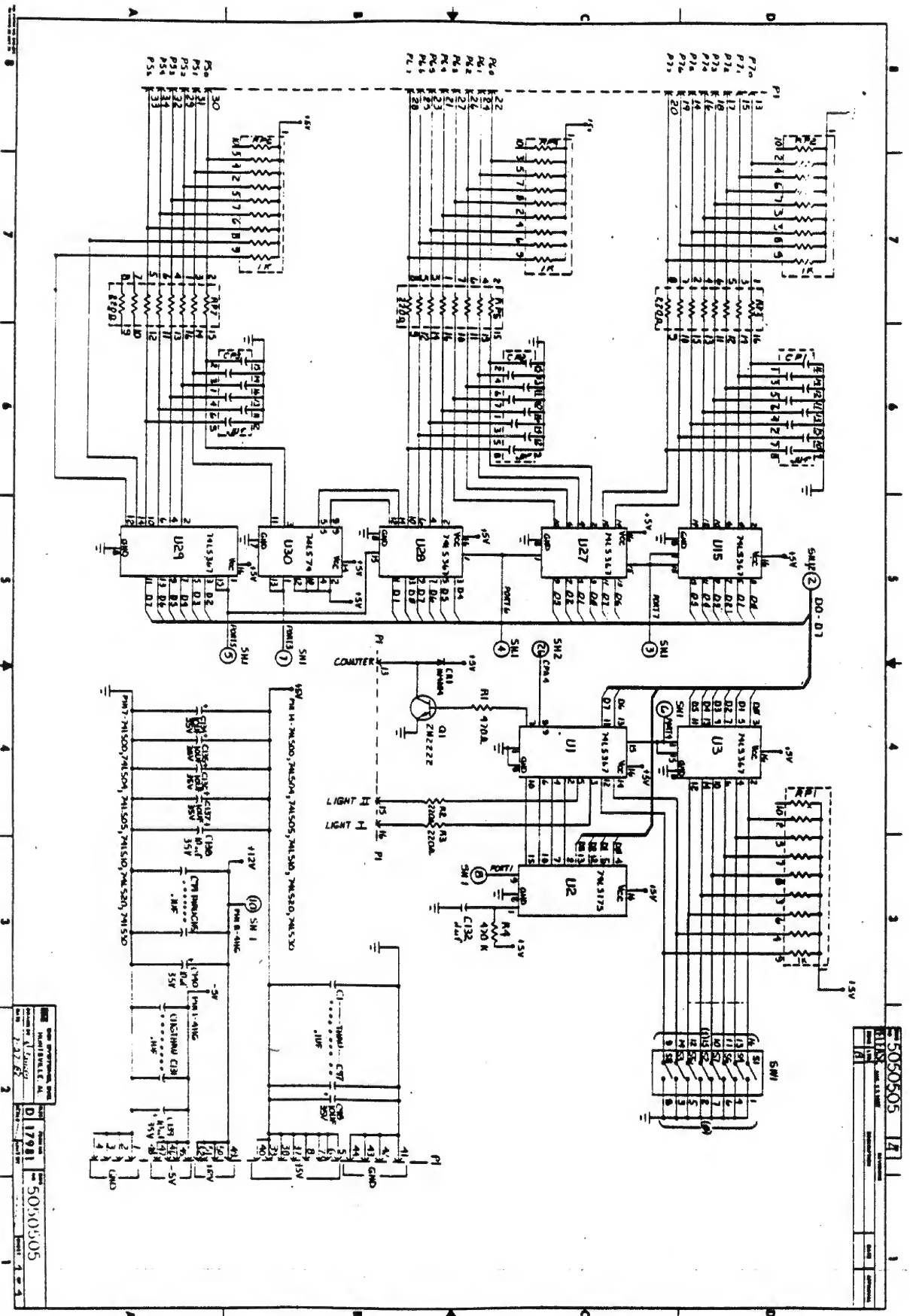






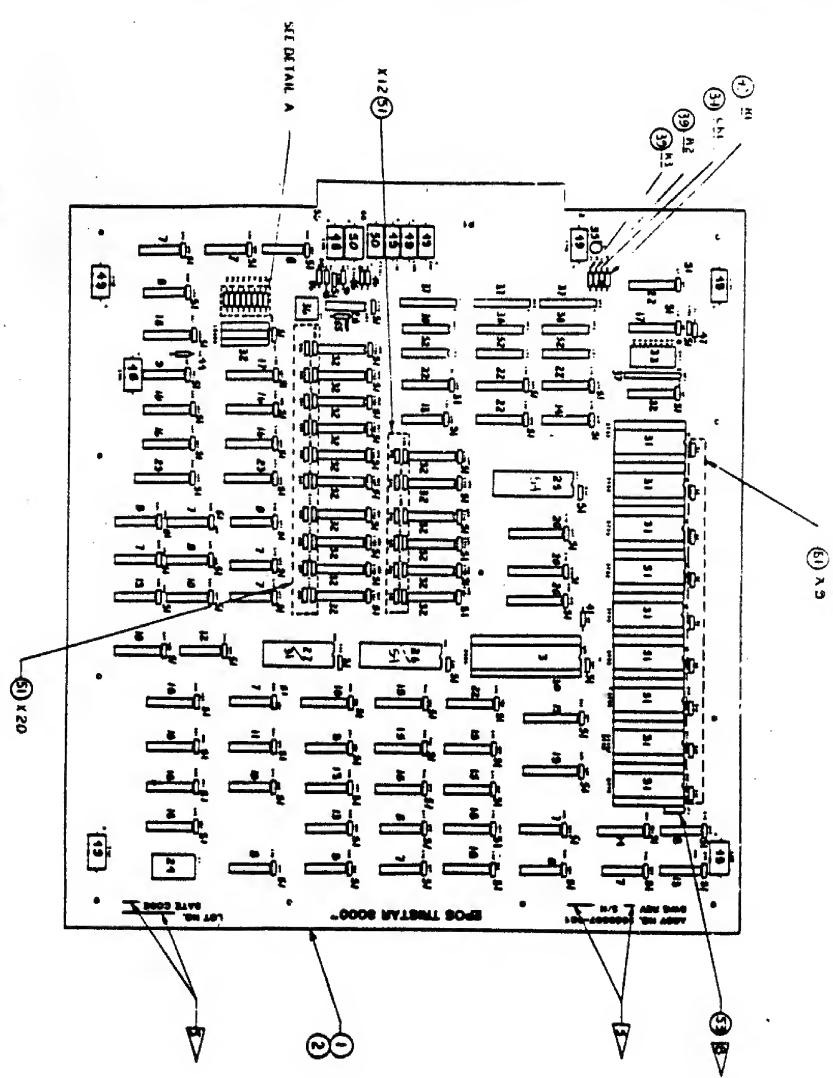
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  - R10 32
  - R11 33
  - R12 33
  - R13 32
  - R14 33
  - R15 33
  - R16 32
- DETAIL A

NOTES:

1. COMPONENT SIDE OF BOARD SHOWN
  2. PARTIAL REFERENCE DESIGNATIONS ARE SHOWN. FOR COMPLETE DESIGNATIONS, REFER WITH UNIT NUMBER AND ASSY DESIGNATIONS
  3. WORKMANSHIP TO MEET GOOD COMMERCIAL STANDARDS PER INC-CE-790
  4. REFERENCE DRAWING: SCHEMATIC 5050507
  5. APPLY APPROPRIATE INFORMATION IN PLACES SHOWN PER SCI PS-B104.
  6. ALL ITEMS ON CIRCUIT SIDE MUST BE TRIMMED TO A MINIMUM OF .06 FROM BOARD SURFACE.
  7. ITEMS 4, 5, 21 AND 23 TO BE DROPPED & SHIPPED TO CUSTOMER AND INSTALLED BY CUSTOMER.
- INSTALL JUMPER WIRE AS REQUIRED PER ENGINEERING INQUIRY.

001 SHOWN

SEE SEPARATE PARTS LIST

AUTHORIZED REPRESENTATIVE NAME: <i>[Signature]</i> TITLE: <i>[Signature]</i> DATE: <i>[Signature]</i>		AUTHORIZED REPRESENTATIVE NAME: <i>[Signature]</i> TITLE: <i>[Signature]</i> DATE: <i>[Signature]</i>	
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